STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0024929
Owner:	City of Kansas City
Address:	4800 East 63rd Street, Kansas City, MO 64130
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	KC, Westside Wastewater Treatment Plant
Address:	1849 Woodswether Road, Kansas City, MO 64105
Legal Description:	Facility - NW ¼, NW ¼, Sec. 6, T49N, R33W, Jackson County Outfall - SE ¼, SW ¼, Sec. 31, T50N, R33W, Jackson County
Receiving Stream:	Missouri River (P)
First Classified Stream and ID:	Missouri River (P)(00356)
USGS Basin & Sub-watershed No.:	(10300101-010070)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 – POTW - SIC #4952
Activated sludge/primary sedimentation/sludge pumped to Blue River WWTF for incineration or digestion/land application or pumped to Kaw Point (KCKS) WWTF for incineration.
Design population equivalent is 225,000.
Design flow is 22.5 MGD.
Actual flow is 10 MGD.
Design sludge production is 6,300 dry tons/year.
Actual sludge production is 2,800 dry tons/year.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

May 28, 2004
Effective Date

Stephen M. Mahfood, Director, Department of Natural Resources
Executive Secretary, Clean Water Commission

May 27, 2009
Expiration Date

Jim Hull, Director of Staff, Clean Water Commission

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001 Flow	MGD	*		*	once/weekday**	24 hr. total
Biochemical Oxygen Demand$_5$***	mg/L		45	30	once/weekday**	24 hr. composite
Total Suspended Solids***	mg/L		45	30	once/weekday**	24 hr. composite
pH – Units	SU	****			once/weekday**	grab
Ammonia as N (May – October) (November – April)	mg/L	 63.0 38.4		 31.3 19.1	once/weekday**	grab
MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE July 28, 2004.						
Arsenic	mg/L	*		*	once/quarter	24 hr. comp.
Cadmium, Total Recoverable	mg/L	*		*	once/quarter	24 hr. comp.
Chromium, Total Recoverable	mg/L	*		*	once/quarter	24 hr. comp.
Copper, Total Recoverable	mg/L			0.075	once/quarter	24 hr. comp.
Mercury, Total Recoverable	mg/L	*		*	Once/quarter	24 hr. comp.
Nickel, Total Recoverable	mg/L	*		*	Once/quarter	24 hr. comp.
Zinc, Total Recoverable	mg/L			*	Once/quarter	24 hr. comp.
Lead, Total Recoverable	mg/L	*		*	Once/quarter	24 hr. comp.
Cyanide, amenable to chlorination	mg/L	0.107		0.053	Once/quarter	24 hr. comp.
Oil & Grease	mg/L	15		10	once/quarter	grab
Hardness	mg/L			*	once/quarter	grab
MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE October 28, 2004.						
Total Toxic Organics (Note 1)	mg/L				once/year	grab
MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE October 28, 2004.						
Whole Effluent Toxicity (WET) Test	% Survival	See Special Conditions			twice/year in August & January	24 hr. composite
MONITORING REPORTS SHALL BE SUBMITTED SEMI-ANNUALLY; THE FIRST REPORT IS DUE August 28, 2004. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						

B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.
** Once each weekday means: Monday, Tuesday, Wednesday, Thursday & Friday except nine Federal legal holidays (New Years, Presidents Day, Martin Luther King Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, and Christmas)
*** This facility is required to meet a removal efficiency of 76% or more.
**** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.

Note 1 – See Total Toxic Organics Page

C. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
   (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
   (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

   The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.

3. Changes in Discharges of Toxic Substances

   The permittee shall notify the Director as soon as it knows or has reason to believe:
   (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
      (1) One hundred micrograms per liter (100 µg/L);
      (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
      (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
      (4) The level established in Part A of the permit by the Director.
   (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

4. Report as no-discharge when a discharge does not occur during the report period.

C. SPECIAL CONDITIONS (continued)

5. Sludge and Biosolids Use For Domestic Wastewater Treatment Facilities
   (a) Permittee shall comply with the pollutant limitations, monitoring, reporting, and other requirements in accordance with the attached permit Standard Conditions.
   (b) Site-Specific conditions applicable to this facility are as follows:
      1. Combined waste sludge is usually pumped to Blue River WWTP for further processing and then transported to the Birmingham WWTP for reuse by land application. By inter-municipal agreement, waste sludge may be pumped to the Kansas City Kansas Kaw Point WWTP for processing and disposal. Consequently, no testing is required under this permit. Permittee shall report dry tons of sludge produced each year.
      2. The department has approved the construction permit program to regulate and approve construction of a sanitary sewer in the area tributary to this wastewater treatment plant or within the city limits. This approval may be revoked in whole or in part by the department if the city sewage collection, transportation, or treatment facilities reach their design limitations, if the facility falls into chronic noncompliance with the permit, or if the city fails to follow the terms and conditions of the approved program.
      3. When any of the above mentioned conditions are met, the permittee will be notified and the construction permit authorization shall be terminated. The termination may be for an area experiencing problems or for the entire construction permit approval.

6. General Criteria. The following water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
   (a) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
   (b) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
   (c) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
   (d) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
   (e) There shall be no significant human health hazard from incidental contact with the water;
   (f) There shall be no acute toxicity to livestock or wildlife watering;
   (g) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
   (h) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

7. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF WET TESTING FOR THIS PERMIT				
OUTFALL	A.E.C. %	FREQUENCY	SAMPLE TYPE	MONTH
#001	10 %	Annually	24 hr. composite	August
#001	20.2 %	Annually	24 hr. composite	January

C. SPECIAL CONDITIONS (continued)

7. Whole Effluent Toxicity (WET) (continued)

(a) Test Schedule and Follow-Up Requirements

(1) Perform a single-dilution test in the months and at the frequency specified above. If the effluent passes the test, do not repeat the test until the next test period.
Submit test results along with complete copies of the test reports as received from the laboratory within 30 calendar days of availability to the WPCP, Water Quality Section, P.O. Box 176, Jefferson City, MO 65102.

(2) If the effluent fails the test, a multiple dilution test shall be performed within 30 calendar days , and biweekly thereafter, until one of the following conditions are met:

(a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
(b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.

(3) The permittee shall submit a summary of all test results for the test series along with complete copies of the test reports as received from the laboratory to the WPCP, Planning Section, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.

(4) Additionally, the following shall apply upon failure of the third test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permitee shall contact WPCP, Planning Section to ascertain as to whether a TIE or TRE is appropriate . The permittee shall submit a plan for conducting a TIE or TRE to the Planning Section of the WPCP within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.

(5) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.

(6) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.

(7) All failing test results shall be reported to WPCP, Planning Section, P.O. Box 176, Jefferson City, MO 65102within 14 calendar days of the availability of the results.

(8) When WET test sampling is required to run over one DMR period, each DMR report shall contain information generated during the reporting period.

(9) Submit a concise summary of all test results with the annual report.

C. SPECIAL CONDITIONS (continued)

7. Whole Effluent Toxicity (WET) (continued)

(b) PASS/FAIL procedure and effluent limitations:

(1) To pass a single-dilution test, mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the upstream receiving-water control sample. The appropriate statistical tests of significance will be those outlined in the most current USEPA acute toxicity manual or those specified by the MDNR.

(2) To pass a multiple-dilution test:

(a) the computed percent effluent at the edge of the zone of initial dilution, Acceptable Effluent Concentration (AEC), must be less than three-tenths (0.3) of the LC_{50} concentration for the most sensitive of the test organisms; or,
(b) all dilutions equal to or greater than the AEC must be nontoxic. Failure of one multiple-dilution test is an effluent limit violation.

(c) Test Conditions

(1) Test Type: Acute Static non-renewal

(2) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.

(3) Test period: 48 hours at the "Acceptable Effluent Concentration" (AEC) specified above.

(4) When dilutions are required, upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.

(5) Single-dilution tests will be run with:
(a) Effluent at the AEC concentration;
(b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
(c) reconstituted water.

(6) Multiple-dilution tests will be run with:
(a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;
(b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
(c) reconstituted water.

(7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.

C. SPECIAL CONDITIONS (continued)

7. Pre-Treatment

(a) Permittee shall implement and enforce its approved pretreatment program in accordance with the requirements of 40 CFR Part 403. The approved pretreatment program is hereby incorporated by reference.
(b) Permittee shall submit to the Department on or before March 31st of each year a report briefly describing its pretreatment activities during the previous calendar year. At a minimum, the report shall include the following:
1. An updated list of the permittee's significant industrial users, including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The permittee shall provide a brief explanation of each deletion. This list shall identify which significant industrial users are subject to categorical pretreatment standards and specify which standards are applicable to each significant industrial user. The list shall indicate which significant industrial users are subject to local standards that are more stringent that the categorical pretreatment standards. The permittee shall also list the significant industrial users that are subject only to local requirements;
2. A summary of the status of significant industrial user compliance over the reporting period;
3. A summary of compliance and enforcement activities (including inspections) conducted by the permittee during the reporting period; and
4. Any other relevant information requested by the department.

Combined Sewer Overflows

9. Effluent Limits

A. CSO OUTFALLS.

The permittee is authorized to discharge from the CSO outfalls listed in Attachment A and additional CSO outfalls within the boundaries of the permittee's jurisdiction identified after the effective date of this permit, in accordance with the requirements of Sections B and C below, and other pertinent provisions of this permit.

B. "NINE MINIMUM CONTROLS" TECHNOLOGY-BASED REQUIREMENTS.

The permittee shall continue its compliance with the following technology-based requirements:

1. Proper operation and regular maintenance programs for the sewer system. The permittee shall implement the operation and maintenance plan for the Combined Sewer System (CSS) that will include the elements listed below. The permittee also shall update the plan to incorporate changes to the system and shall operate and maintain the system according to the plan. The permittee shall document implementation of the plan.

- Designation of a Manager for Combined Sewer System. The permittee shall designate a person to be responsible for the wastewater collection system and serve as the contact person regarding the CSS.

- Provision for Trained Staff. The permittee shall continue to provide trained staff to carry out the operation, maintenance, repair, and testing functions required to comply with the terms and conditions of this permit. Each staff member shall receive appropriate training.

C. SPECIAL CONDITIONS (continued)

Combined Sewer Overflows

9. Effluent Limits (continued)

- Inspection and Maintenance of CSS. The permittee shall inspect and maintain CSO diversion structures and pumping stations to see that they are in good working condition and adjusted to minimize CSOs. The permittee shall continue to inspect or cause to be inspected each CSO, as scheduled in the Annual Nine Minimum Controls Report, to confirm that dry weather overflows are not occurring. The inspection shall include, but is not limited to, entering the diversion structure, if accessible; determining the extent of debris and grit buildup; and removing debris that may constrict flow, cause blockage, or result in a dry weather overflow. The permittee shall document the results of the inspections. For CSO outfalls that are inaccessible, the permittee may perform a visual check of the overflow pipe or structure to determine whether a CSO is occurring during dry weather flow conditions.

2. Maximize use of the collection system for storage. The permittee shall continue to maximize the in-line storage capacity. The permittee shall keep records to document its sewer rehabilitation and separation work. The permittee shall maintain all diversion structures at their current heights as of [insert date of permit issuance] or greater.

3. Review and Modification of Pretreatment Program To Reduce CSO Impacts. The permittee shall continue to implement its approved pretreatment program to minimize the impact of non-domestic discharges on CSOs. The permittee shall re-evaluate at an appropriate frequency whether additional modifications to its pretreatment program are feasible or of practical value. The permittee shall document this evaluation and implementation.

4. Maximization of Flow to the Treatment Plant. The permittee shall operate the treatment plant at maximum treatable flow during wet weather flow conditions/events and deliver flows to the treatment plant within the constraints of the collection system, pump stations, and capacity of the wastewater treatment plant. The permittee shall document these actions.

5. Elimination of Combined Sewer Overflows During Dry Weather. Permittee must minimize and eliminate dry weather overflows within its control in the CSS. Dry weather overflows must be reported to the Department as soon as the permittee becomes aware of a dry weather overflow. When the permittee detects a dry weather overflow, the permittee shall begin corrective action immediately. The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated. The permittee shall document each dry weather overflow, its cause, corrective measures taken, and the dates of beginning and cessation of overflow.

6. Control of Solids and Floatables. The permittee shall continue to implement measures to control solid and floatable materials in CSOs.

7. Pollution Prevention and Public Education Program. The permittee shall continue to implement a pollution prevention and public education program focused on reducing the impact of CSOs on receiving waters. The permittee shall document pollution prevention implementation activities.

8. Public Notification Program. The permittee shall continue implementation of its Public Notification Program to inform citizens of when and where CSOs occur, using signs and other media and alert mechanisms.

C. SPECIAL CONDITIONS (continued)

Combined Sewer Overflows

9. Effluent Limits (continued)

9. Monitoring Program. The permittee shall continue to implement regularly scheduled visual inspections and other simple methods to determine the occurrence and apparent impacts of CSOs.

10. The permittee shall document implementation as described above of the Nine Minimum Controls, and shall retain these records in accordance with the State and Local Records Law as codified in Section 109.200 RSMo. et seq., and standards and regulations promulgated pursuant thereto.

C. THE PERMITTEE'S LONG-TERM CONTROL PLAN ("LTCP").

The permittee shall develop a Long-Term Control Plan in accordance with the *Guidance for Long-Term Control Plan*, EPA, September, 1995, which will address the elements contained in Sections 1 through 3 below:

1. Long-Term Control Work Plan

The permittee shall develop a CSO Long-Term Control Work Plan (LTCWP) which will review the CSS, stream usage and appropriate water quality standards, water quality data, and regulatory requirements to provide a preliminary evaluation of technologies and order-of-magnitude cost estimates. The CSO LTCWP will also identify additional data required to further evaluate alternatives and a schedule to collect the data and develop a Long-Term Control Plan, as described in Section C.3. below. This information will be summarized in the report "Long-Term Control Work Plan".

2. Public Participation

The permittee shall prepare and implement a public participation plan that outlines how the permittee will ensure participation of the public throughout the LTCP development process.

3. Long-Term Control Plan

a. CSS Characterization

The permittee's Long-Term Control Work Plan will include a comprehensive characterization of the Combined Sewer Systems ("CSS"), including the interceptor sewer system, developed through records review, monitoring, modeling, and other means as appropriate to establish the existing baseline conditions, evaluate the effectiveness of the CSO technology-based controls (NMCs), and determine the baseline conditions upon which the LTCP will be based. The characterization shall adequately address the response of the CSS to various precipitation events; identify the number, location, frequency, and characteristics of CSOs; identify receiving water quality impacts that result from CSOs; and review water quality standards and recommend appropriate revisions.

To complete the characterization, the permittee shall employ the following methods:

i. Rainfall Records Review. The permittee shall examine rainfall records for the geographic areas of the CSS and evaluate the flow variations in the receiving body to correlate between the CSOs and receiving water conditions.

C. SPECIAL CONDITIONS (continued)

Combined Sewer Overflows

9. Effluent Limits (continued)

ii. CSS Records Review. The permittee shall review and evaluate CSS records and undertake field inspections and other necessary activities to identify the number, location, and frequency of CSOs and their location relative to sensitive areas and to pollution sources, such as significant industrial users, in the collection system.

iii. CSO and Water Quality Monitoring. The permittee shall develop a monitoring program that measures the frequency, duration, flow rate, volume, and pollutant concentration of CSOs and assesses the impact of the CSOs on receiving waters. Monitoring shall be performed at a representative number of CSOs for a representative number of events. The monitoring program shall include CSOs and ambient receiving water monitoring and, where appropriate, other monitoring protocols, such as biological assessments, toxicity testing, and sediment sampling.

iv. Identification of Sensitive Areas. The permittee shall identify sensitive areas where its CSOs occur. These areas shall include waters with threatened or endangered species and their designated critical habitat, waters with whole body contact recreation, public drinking water intakes or their designated protection areas and any other areas identified by the permittee, in coordination with appropriate State or Federal agencies.

v. CSS and Receiving Water Modeling. The permittee may employ models, which include appropriate calibration and verification with field measurements, to aid in the characterization. If models are used, they shall be identified by the permittee along with an explanation of why the model was selected and used in the characterization.

b. CSO Control Alternatives

The permittee shall develop a range of CSO control alternatives that will ultimately enable the permittee to select CSO controls in consultation with the Department. This evaluation will consider compliance with appropriate water quality standards either through the presumptive approach or the demonstrative approach as described below:

1. Presumptive Approach

Under the presumptive approach, controls adopted in the LTCP would be required to meet one of the following criteria:

a. No more than an average of 8-12 overflows events per year. For the purpose of this criterion, an overflow event is one or more overflows from a CSS as the result of a precipitation event that does not receive the minimum treatment specified (see definition of minimum treatment below); or

b. The elimination or the capture for treatment of no less than 85% by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis; or

C. SPECIAL CONDITIONS (continued)

Combined Sewer Overflows

9. Effluent Limits (continued)

c. The elimination or removal of no less than the mass of the pollutants identified as causing water quality impairment through the sewer system characterization, monitoring, and modeling effort for the volumes that would be eliminated or captured for treatment under paragraph b above.

The minimum level of treatment applicable to paragraphs a and b above is defined as follows:

i. Primary clarification: removal of floatable and settleable solids may be achieved by any combination of treatment technologies or methods that are shown to be equivalent to primary clarification;

ii. Solids and floatables disposal; and

iii. Disinfection of effluent, if necessary, to meet appropriate water quality standards, including removal of harmful disinfection chemical residuals, where necessary.

2. Demonstrative Approach

Under the demonstrative approach, the controls adopted in the LTCP would be required to demonstrate each of the following:

a. The planned control program is adequate to protect appropriate designated uses, based on the results of C.3.a.iii. & v.; and

b. The CSOs remaining after implementation of the planned control program will not contribute to impairment of the receiving waters based on the results of C.3.a.iii. & v. above; and

c. The planned control program will provide the maximum pollution reduction benefits reasonably attainable including the cost/performance considerations below; and

d. The planned control program is designed to allow cost-effective expansion or cost-effective retrofitting if additional controls are subsequently determined to be necessary to meet appropriate water quality standards.

c. Evaluation of CSO Control Alternatives

The permittee shall evaluate each of the alternatives developed on its ability to achieve compliance with CWA requirements. The permittee shall consider expansion of the POTW treatment plant’s secondary and primary capacity as an alternative

d. Cost/Performance Considerations

The permittee shall develop cost/performance data that demonstrate the relationship among the set of CSO control alternatives identified in C.3.b.

C. SPECIAL CONDITIONS (continued)

Combined Sewer Overflows

9. Effluent Limits (continued)

e. Identification of the Selected CSO Control Alternatives

The permittee shall describe the alternatives that were considered, the chosen alternatives that will be implemented, and the reasoning behind the selections.

f. The information and data developed in a-e above shall be summarized in a report titled “Long Term Control Plan”.

D. LTCP COMPLIANCE DATES

1. The permittee shall submit two copies of the following plans, which shall be developed in accordance with the requirements specified in Sections C.1 & 2 above, to the Department for review and approval within twelve (12) months from issuance of this permit.

- Long-Term Control Work Plan
- Public Participation Plan

2. The permittee shall submit two copies of a completed LTCP, developed in accordance with the requirements specified in Section C.3 for review by the Department, in accordance with the schedule in the Long-Term Control Work Plan approved by the Department.

3. Upon Department approval of the LTCP, the Department will propose a modification to this NPDES permit to include a schedule of compliance for design and construction and/or implementation of the selected CSO control methods and development of an implementation schedule and funding plan, an operational plan, and a post-construction monitoring program in accordance with Section E. below.

E. SUBSEQUENT REQUIREMENTS

Once the LTCP has been approved by the Department, the following shall occur:

1. Implementation Schedule and Funding Plan

The permittee shall submit a schedule for design and construction of the selected CSO control facilities, and/or implementation of other measures. The schedule may be phased based on the relative importance of the adverse impacts on water quality of the receiving water and on the permittee’s financial capability to fund the selected CSO controls.

2. Operational Plan

The permittee shall submit a revised operation and maintenance plan that addresses implementation of the selected CSO controls. The revised operation and maintenance plan shall maximize the removal of pollutants during and after each precipitation event using available facilities within the collection and treatment system.

C. SPECIAL CONDITIONS (continued)

Combined Sewer Overflows

9. Effluent Limits (continued)

3. Post-Construction Monitoring Program

The permittee shall develop and submit a post-construction monitoring program adequate to ascertain the effectiveness of the CSO controls. The program shall include a plan detailing the monitoring protocols to be followed, including CSO and receiving water monitoring, and, where appropriate, other monitoring protocols, such as biological assessments, whole effluent toxicity testing, and sediment sampling.

ATTACHMENT A

OUTFALL LOCATIONS

Outfall	Description	Latitude	Longitude	Receiving Water
002	Broadway Pump Station Outfall	39 deg 05.661 min	94 deg 35.304 min	Missouri River
003	Santa Fe Pump Station Outfall	39 deg 06.493 min	94 deg 35.856 min	Missouri River
004	Downtown Airport Pump Station Outfall	39 deg 06.842 min	94 deg 35.575 min	Missouri River
005	Turkey Creek Sewer Outfall	39 deg 05.145 min	94 deg 36.523 min	Kaw River
006	Penn Valley Lake	39 deg 04.525 min	94 deg 35.325 min	Penn Valley Lake

SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR,the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms,

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for (Pimephales promelas):

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

Total Toxic Organics (Note 1)

Acenaphthene
Acrolein
Acrylonitrile
Benzene
Benzidine
Carbon Tetrachloride (tetrachloromethane)
Chlorobenzene
1,2,4-trichlorobenzene
Hexachlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
Hexachloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
Chloroethane
Bis (2-chloroethyl) ether
2-chloroethyl vinyl ether
N-nitrosodi-n-propylamine
Pentachlorophenol
Phenol
Bis (2-ethylhexyl) phthalate
Butyl benzyl phthalate
(dibenzo(a,h)anthracene)
Di-n-butyl phthalate

Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
1,2-benzanthracene (benzo(a)anthracene)
Benzo(a)pyrene (3,4-benzopyrene)
3,4-benzofluoranthene (benzo(b)fluoranthene)
11,12-benzofluoranthene (benzo(k)fluoranthene)
Chrysene
metabolites)
Anthracene
1,12-benzoperylene (benzo(ghi)perylene)
Fluorene
2-chloronaphthalene
2,4,6-trichlorophenol
Parachlorometa cresol
Chloroform (trichloromethane)
2-chlorophenol
1,2-dichlorobenzene
1,3-dichlorobenzene
hexachlorocyclohexane)
1,4-dichorobenzene
3,3-dichlorobenzidine
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol
1,2-dichloropropane (1,3-dichloropropane)
2,4-dimethylphenol
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
Ethylbenzene
Fluoranthene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
Bis (2-chloroisopropyl) ether
Bis (2-chloroethoxy) methane
Methylene Chloride (dichloromethane)
Methyl Chloride (chloromethane)
Methyl bromide (bromomethane)
Bromoform (tribromomethane)
Dichlorobromomethane
Chlorodibromemethane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
2-nitrophenol
4-nitrophenol
2,4-dinitrophenol
4,6-dintro-o-cresol
N-nitrosodimethylamine
N-nitrosodiphenylamine
Phenanthrene
1,2,5,6-dibenzanthracene

Indeno (1,2,3-cd) pyrene
(2,3-o-phenylene pyrene)
Pyrene
Tetrachloroethylene
Toluene
Trichloroethylene
Vinyl Chloride (chloroethylene)
Aldrin
Dieldrin
Chlordane (technical mixture and

4,4-DDT
4,4-DDE (p,p-DDX)
4,4-DDD (p,p-TDE)
Alpha-endosulfan
Beta-endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide (BHC

Alpha-BHC
Beta-BHC
Gamma-BHC
Delta-BHC (PCB polychlorinated biphenyls)
PCB-1242 (Arochlor 1242)
PCB-1254 (Arochlor 1254)
PCB-1221 (Arochlor 1221)
PCB-1232 (Arochlor 1232)
PCB-1248 (Arochlor 1248)
PCB-1260 (Arochlor 1260)
PCB-1016 (Arochlor 1016)
Toxaphene

Date of Fact Sheet: December 8, 2003

Date of Public Notice: December 19, 2003

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FACT SHEET

This Fact Sheet explains the applicable regulations, rationale for development of this permit and the public participation process.

NPDES PERMIT NUMBER: MO-0024929

FACILITY NAME: KC, Westside Sewage Treatment Plant

OWNER NAME: City of Kansas City

LOCATION: Sec. 31, T50N, R33W, Jackson County

RECEIVING STREAM: Missouri River

FACILITY CONTACT PERSON: Robert Williamson TELEPHONE: (816) 513-7205

FACILITY DESCRIPTION AND RATIONALE

This is a proposed reissuance of an existing State Operating Permit No. MO-0024929, for Westside Sewage Treatment Plant, 1849 Woodswether Road, Kansas City, MO 64105, owned by the City of Kansas City, 4800 East 63rd Street, Kansas City, MO 64130, to discharge to the Missouri River (Missouri River and Western Tributaries Basin), at SW ¼, SW ¼, Sec. 31, T50N, R33W, Jackson County, wastewater resulting from domestic wastewater from a wastewater treatment plant. The discharge is an existing discharge with a present average flow of 10 MGD and a design flow of 22.5 MGD. Reissuance is proposed to renew permit which expires September 29, 1992. Sludge is disposed of in accordance with the interim federal sludge program. The proposed permit terms and conditions were prepared by the Kansas City Regional Office.

A fact sheet has been prepared for this permit by the Department of Natural Resources. Copies are being sent to the applicant, to the District Engineer of the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the Environmental Protection Agency and the Missouri Department of Conservation. Other interested persons may obtain a copy upon request from the Department of Natural Resources, Division of Environmental Quality, P.O. Box 176, 205 Jefferson Street, Jefferson City, MO 65102. Please include the application number of the draft permit.

The Federal Water Pollution Control Act ("Clean Water Act" Section 402 Public Law 92-500 as amended) established the National Pollutant Discharge Elimination System (NPDES) permit program. This program regulates the discharge of pollutants from point sources into the waters of the United States. All such discharges are unlawful without a permit (Section 301 of the "Clean Water Act"). After a permit is obtained, a discharge not in compliance with all permit terms and conditions is unlawful. Permits in Missouri are issued by the Director of the Department of Natural Resources under an approved program, operating in accordance with federal and state laws (Federal "Clean Water Act" and "Missouri Clean Water Law" Section 644 as amended).

10 CSR 20-7.031 Missouri Water Quality Standards, Missouri Department of Natural Resources (the Department) "defines the Clean Water Commission's water quality objectives in terms of water uses to be maintained and the criteria to protect those uses".

In order to protect these beneficial uses and the water quality of the Missouri River (Missouri and Western Tributaries Basin), effluent limitations are being established under federal and state laws. The current Department effluent regulations 10 CSR 20-7.015(3)(C) states that non-domestic waste discharges "shall meet the applicable control technology currently effective or that which will become effective during the life of the permit. Where this definition is not available or applicable the Department shall set specific parameter limitations using best engineering judgment as defined in 402(a)(1) of the Federal Clean Water Act".

The monitoring requirements for all parameters have been established by the Department in compliance with 10 CSR 20-7.015 Effluent Regulation.

The standard conditions attached to the draft permit are applied to all state operating permittees. They reflect requirements of federal (40 CFR 122) and state law (10 CSR 20-Chapter 6) with respect to state operating permittee duties, responsibilities and liabilities.

This permit will be issued for a period of five years.

Missouri Department of Natural Resource
Water Pollution Control Program
Planning Section

Water Quality Review Sheet

Determination of Effluent Limits

Facility Information

FACILITY NAME: Kansas City Westside WWTP NPDES #: MO-0024929

FACILITY TYPE/DESCRIPTION: Activated Sludge

ECOREGION: Central Dissected Plains (Central Irregular Plains, Mississippi Alluvial Plains) 8- DIGIT HUC: 10300101 (Osage Plains, Ozark Highlands) COUNTY: Jackson

LEGAL DESCRIPTION: SE ¼, SW ¼, Sec. 31, T50N, R33W LATITUDE/LONGITUDE: 39.10967-94.60631

WATER QUALITY HISTORY: No stream surveys are available for this site. DMR records indicate compliance with existing limitations.

Outfall Characteristics

OUTFALL	DESIGN FLOW (CFS)	TREATMENT TYPE	RECEIVING WATERBODY	OTHER
001	34.875	Activated Sludge	Missouri River	

Receiving Waterbody Information

WATERBODY	CLASS	7Q10(CFS)	*DESIGNATED USES	OTHER
Missouri River	P	Summer – 17,888 Winter - 5,500	IRR, LWW, DWS, AQL-GWWF, BTG, IND	

*Cool Water Fishery (CLF), Cold Water Fishery (CDF), Irrigation (IRR), Industrial (IND), Boating & Canoeing (BTG), Drinking Water Supply (DWS), Whole Body Contact Recreation (WBC), Protection of Warmwater Aquatic Life and Human Health (AQL), Livestock & Wildlife Watering (LWW)

COMMENTS: Long term 7Q10 was generated from daily discharge data from 1930 – 2000 at USGS 06893000; Missouri River at Kansas City. Gauging station is approx. ¾ mile downstream of WWTP. Summer (May – Oct) Winter (Nov. – April). Pearson III frequency analysis attached.

MIXING CONSIDERATIONS

Allowed mixing is based on 25% of the long term 7Q10 flow. At the request of the permittee, site specific mixing zone modeling could be conducted to review appropriateness of mixing zone allocations presented below.

Mixing Zone. Per 10 CSR 20-7.031(4)(A)5.B.(III)
Summer; (17,888 cfs * 0.25 = 4,472 cfs), Dilution Ratio = 129:1
Winter; (5,500 cfs * 0.25 = 1,375 cfs), Dilution Ratio = 40.4:1

Zone of Initial Dilution (Z.I.D.). Per 10 CSR 20-7.031(4)(A)5.B.(III)
Summer; 10 times the design effluent flow (348 cfs)
Dilution Ratio = 10.9:1
Winter; 10% of the mixing zone flow or (5500*0.25*0.1 = 137 cfs)
Dilution Ratio = 4.9:1

Permit Limits And Information

TMDL WATERSHED: (Y OR N) [Y] W.L.A. STUDY CONDUCTED: (Y OR N) [N] DISINFECTION REQUIRED: (Y OR N) [N] DISINFECTION WAIVER: (Y, N, NA) [N]

OUTFALL# 001 - Primary Outfall

WET TEST (Y OR N): Y FREQUENCY: 2/YEAR A.E.C. NOTE 1 LIMIT: 10 CSR 20-7.031(3)(I)

PARAMETER	MAXIMUM DAILY LIMIT	AVERAGE WEEKLY LIMIT	AVERAGE MONTHLY LIMIT	MONITORING FREQUENCY	SAMPLE TYPE
Flow	*	*	*	Daily	24 hr. Total
BOD_5 (mg/l)		45	30	Daily	24 hr. Composite
TSS (mg/l)		45	30	Daily	24 hr. Composite
pH (SU)	6 - 9			Daily	Grab
NH3-N (Summer)(mg/l)	63.0		31.3	Daily	Grab
NH3-N (Winter)(mg/l)	38.4		19.1	Daily	Grab
Oil & Grease (mg/l)	15		10	Monthly	Grab
Arsenic (mg/l)	*		*	Monthly	Grab
Cadmium (Dissolved)(mg/l)	*		*	Monthly	Grab
Chromium (Dissolved) (mg/l)	*		*	Monthly	Grab
Copper (Dissolved)(mg/l)			0.075	Monthly	Grab
Mercury (Dissolved)(mg/l)	*		*	Monthly	Grab
Nickel (Dissolved)(mg/l)	*		*	Monthly	Grab
Zinc (Dissolved)(mg/l)			1.075	Monthly	Grab
Lead (Dissolved)(mg/l)	*		*	Monthly	Grab
Cyanide (Amenable to Chlorination)(mg/l)	0.107		0.053	Monthly	Grab
Hardness (mg/l)	*	*	*	Monthly	Grab
Toxic Organics	Note 2	Note 2	Note 2	Once/Year	Grab

* Monitoring Only

Receiving Water Monitoring Requirements

No in-stream monitoring is recommended at this time

Derivation and Discussion of Limits

Note 1. A.E.C.

Summer; ((34.875/(34.875+348))*100 = 9.1 (**10%**)
Winter; ((34.875/(34.875+137))*100 = **20.2%**

Note 2. Toxic Organic Scan

The concentrations of each of the following toxic chemicals in effluent from outfall 001 shall be determined on a yearly basis *unless* the facility is able to demonstrate that criteria for these compounds are met end-of-pipe.

Toxic Organics

Acenaphthene
Acrolein
Acrylonitrile
Benzene
Benzidine
Carbon Tetrachloride (tetrachloromethane)
Chlorobenzene
1,2,4-trichlorobenzene
Hexachlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
Hexachloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
Chloroethane
Bis (2-chloroethyl) ether
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
Bis (2-chloroisopropyl) ether
Bis (2-chloroethoxy) methane
Methylene Chloride (dichloromethane)
Methyl Chloride (chloromethane)
Methyl bromide (bromomethane)
Bromoform (tribromomethane)
Dichlorobromomethane
Chlorodibromemethane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
2-nitrophenol
4-nitrophenol

2-chloroethyl vinyl ether
N-nitrosodi-n-propylamine
Pentachlorophenol
Phenol
Bis (2-ethylhexyl) phthalate
Butyl benzyl phthalate
(dibenzo(a,h)anthracene)
Di-n-butyl phthalate

Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
1,2-benzanthracene (benzo(a)anthracene)
Benzo(a)pyrene (3,4-benzopyrene)
3,4-benzofluoranthene (benzo(b)fluoranthene)
11,12-benzofluoranthene (benzo(k)fluoranthene)
Chrysene
Anthracene
1,12-benzoperylene (benzo(ghi)perylene)
Fluorene
2-chloronaphthalene
2,4,6-trichlorophenol
Parachlorometa cresol
Chloroform (trichloromethane)
2-chlorophenol
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichorobenzene
3,3-dichlorobenzidine
1,1-dichloroethylene
1,2-trans-dichloroethylene
2,4-dichlorophenol
1,2-dichloropropane (1,3-dichloropropane)
2,4-dimethylphenol
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
Ethylbenzene
Fluoranthene
Toxaphene

2,4-dinitrophenol
4,6-dintro-o-cresol
N-nitrosodimethylamine
N-nitrosodiphenylamine
Phenanthrene
1,2,5,6-dibenzanthracene

Indeno (1,2,3-cd) pyrene
(2,3-o-phenylene pyrene)
Pyrene
Tetrachloroethylene
Toluene
Trichloroethylene
Vinyl Chloride (chloroethylene)
Aldrin
Dieldrin
Chlordane (technical mixture and metabolites)
4,4-DDT
4,4-DDE (p,p-DDX)
4,4-DDD (p,p-TDE)
Alpha-endosulfan
Beta-endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide (BHC hexachlorocyclohexane)
Alpha-BHC
Beta-BHC
Gamma-BHC
Delta-BHC (PCB polychlorinated biphenyls)
PCB-1242 (Arochlor 1242)
PCB-1254 (Arochlor 1254)
PCB-1221 (Arochlor 1221)
PCB-1232 (Arochlor 1232)
PCB-1248 (Arochlor 1248)
PCB-1260 (Arochlor 1260)
PCB-1016 (Arochlor 1016)

- **BOD_5, TSS, pH.** Secondary treatment standards per 10 CSR 20-7.015. These are existing permit conditions and should be carried over.

- **Ammonia – Nitrogen.**
Mass balance using first order decay coefficients of 0.1 $^{-1}$day. Chronic and acute criteria were based on in-stream pH, temperature, and ammonia data from samples collected by Kansas City Public Works in 1999 and 2000. Alternative pH and temperature may be considered if site specific data are submitted. Limits derived based on EPA guidelines outlined in EPA/505/2-90/001.

Summer (May-Oct.)			Winter (Nov.- Apr.)		
Upstream NH_3-N	=	0.06 mg/l	Upstream NH_3-N	=	0.11 mg/l
Temperature	=	22.8 C	Temperature	=	7.1 C
pH	=	8.2	pH	=	8.1
W.L.A.	=	63.0	W.L.A.	=	38.4 mg/l
C.V.	=	0.6	C.V.	=	0.6
L.T.A.	=	20.223	L.T.A.	=	12.3264
M.D.L.	=	**63 mg/l**	M.D.L.	=	**38.4 mg/l**
N	=	4	N	=	4
A.M.L.	=	**31.3 mg/l**	A.M.L.	=	**19.1 mg/l**

- **Copper, Zinc.** Existing limitations for these contaminants are protective of designated uses and should be carried over.

Prepared by: Chris Zell
Reviewer: Richard Laux
Date: 08-28-2002
Unit Chief: Richard Laux

Monitoring and effluent limits contained within this document have been developed in accordance with EPA guidelines using the best available data and are believed to be consistent with Missouri's Water Quality Standards and Effluent Regulations. If additional water quality data or anecdotal information are available that may affect the recommended monitoring and effluent limits, please forward these data and information to the author.

Appendix A

A.1 Summer 7 Day Low Flow Statistics for 06893000; MO River at Kansas City

Log-Pearson Type III Statistics
SWSTAT 4.1
(based on USGS Program A193)

May 1 - start of season
October 31 - end of season
1929 - 1999 - time period
7-day low - parameter
71 - non-zero values
0 - zero values
0 - negative values (ignored)

The following 7 statistics are based on non-zero values:

Mean (logs)	4.526
Variance (logs)	0.042
Standard Deviation (logs)	0.204
Skewness (logs)	-0.865
Standard Error of Skewness (logs)	0.285
Serial Correlation Coefficient (logs)	0.791
Coefficient of Variation (logs)	0.045

Non-exceedance Probability	Recurrence Interval	Parameter Value
0.0100	100.00	8448.651
0.0200	50.00	10447.364
0.0500	20.00	14050.961
0.1000	**10.00**	**17888.246**
0.2000	5.00	23330.945
0.3333	3.00	29060.117
0.5000	2.00	35871.379
0.8000	1.25	50138.516
0.9000	1.11	57696.809
0.9600	1.04	65438.680
0.9800	1.02	70131.313
0.9900	1.01	74081.617

A.2 Winter 7 Day Low Flow Statistics for 06893000; MO River at Kansas City

Log-Pearson Type III Statistics
SWSTAT 4.1
(based on USGS Program A193)

November 1 - start of season
April 30 - end of season
1929 - 2000 - time period
7-day low - parameter
72 - non-zero values
0 - zero values
0 - negative values (ignored)

The following 7 statistics are based on non-zero values:

Mean (logs)	4.123
Variance (logs)	0.086
Standard Deviation (logs)	0.294
Skewness (logs)	-0.203
Standard Error of Skewness (logs)	0.283
Serial Correlation Coefficient (logs)	0.720
Coefficient of Variation (logs)	0.071

Non-exceedance Probability	Recurrence Interval	Parameter Value
0.0100	100.00	2486.371
0.0200	50.00	3074.077
0.0500	20.00	4197.956
0.1000	**10.00**	**5500.114**
0.2000	5.00	7565.470
0.3333	3.00	10079.145
0.5000	2.00	13577.331
0.8000	1.25	23592.016
0.9000	1.11	31094.898
0.9600	1.04	41350.777
0.9800	1.02	49458.133
0.9900	1.01	57903.121